Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listings of Claims:

Claim 1: (currently amended) A method of forming a metal interconnect ~~titanium layer~~ on a substrate, the method comprising:

placing the substrate in a deposition chamber comprising a source of titanium; and

depositing a ~~the~~ titanium layer onto the substrate by physical vapor deposition of the source of titanium under conditions wherein the atmosphere in the deposition chamber comprises hydrogen in a concentration of at least 0.1 molar percent ~~and wherein the hydrogen is activated, whereby the titanium layer has a preferred crystal orientation~~; and

depositing an aluminum layer over the titanium layer.

Claim 2: (previously presented) The method of Claim 1 wherein the source of titanium is a sputtering target and wherein depositing the titanium layer onto the substrate is sputter depositing the titanium layer by applying power to the sputtering target.

Claim 3: (previously presented) The method of Claim 2 wherein the titanium layer has a <0002> crystal orientation.

Claim 4: (original) The method of Claim 2 wherein the atmosphere comprises argon and hydrogen.

Claim 5: (original) The method of Claim 3 further comprising flowing a gas mixture comprising at least 0.1 molar percent hydrogen while sputter depositing the titanium layer.

Claim 6: (previously presented) The method of Claim 3 wherein applying power to the target comprises providing a power density on the target of at least about 0.5 watt per square centimeter of target area.

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Claim 7: (previously presented) The method of Claim 6 wherein applying power to the target comprises providing a power density on the target of between about 3 and about 8 watts per square centimeter of target area.

Claim 8: (canceled)

Claim 9: (currently amended) A ~~The~~ method of ~~Claim 2~~ forming a titanium layer on a substrate, the method comprising:

placing the substrate in a deposition chamber comprising a titanium sputtering target; and

~~further comprising,~~ after placing the substrate in the deposition chamber, ~~:~~ introducing a quantity of hydrogen into the deposition chamber without providing power to the titanium sputtering target; and

sputter depositing the titanium target onto the substrate by physical vapor deposition of the titanium sputtering target by applying power to the titanium sputtering target under conditions wherein the atmosphere in the deposition chamber comprises hydrogen and wherein the hydrogen is activated, whereby the titanium layer has a preferred crystal orientation.

Claim 10: (previously presented) The method of Claim 9 wherein introducing a quantity of hydrogen comprises flowing a gas comprising hydrogen into the deposition chamber.

Claim 11: (previously presented) A method of forming a titanium layer on a substrate, the method comprising:

placing the substrate in a sputtering chamber comprising a titanium target;

flowing a first gas comprising hydrogen into the sputtering chamber through a first gas injector;

terminating the flow of the first gas; and

after the flow of the first gas has been terminated, sputter depositing the titanium layer onto the substrate by applying power to the target and by providing a second gas in the sputtering chamber through a second gas injector, wherein the hydrogen is activated and whereby the deposited titanium layer has a preferred crystal orientation.

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Claim 12: (original) The method of Claim 11 wherein the first gas comprises argon and hydrogen.

Claim 13: (original) The method of Claim 12 wherein the second gas is an inert gas.

Claim 14: (original) The method of Claim 12 wherein the first gas injector is positioned proximate the target.

Claim 15: (original) The method of Claim 14 wherein the titanium target is planar and wherein flowing the first gas provides a quantity of hydrogen in the sputtering chamber that is at least 0.5×10^{-4} standard cubic centimeters of hydrogen per square centimeter of target surface area.

Claim 16: (previously presented) The method of Claim 11 wherein applying power to the target comprises providing a power density on the target of at least about 0.5 watt per square centimeter of target area.

Claim 17: (previously presented) The method of Claim 16 wherein applying power to the target comprises providing a power density on the target of between about 3 and about 8 watts per square centimeter of target area.

Claim 18: (currently amended) The ~~A~~ method of Claim 1 wherein ~~depositing an aluminum layer, the method comprising:~~

~~depositing a titanium layer wherein depositing a titanium layer comprises:~~

~~placing the substrate in a deposition chamber comprising a source of titanium; and~~

~~depositing the titanium layer onto the substrate by physical vapor deposition of the source of titanium under conditions wherein the atmosphere in the deposition chamber comprises hydrogen and wherein the hydrogen is activated, whereby the titanium layer has a <0002> crystal orientation; and~~

~~depositing an aluminum layer overlying the titanium layer, whereby~~ the aluminum layer has a <111> crystal orientation.

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Claim 19: (currently amended) The method of Claim 18 wherein ~~whereby~~ a full width at half maximum of a <111> X-ray diffraction signal of the aluminum layer is less than about 1.5 degrees.

Claim 20: (currently amended) A method of depositing a metal interconnect ~~an aluminum layer~~, the method comprising:

depositing a titanium layer the titanium layer deposition comprising:

placing the substrate in a sputtering chamber comprising a titanium target;

flowing a first gas comprising hydrogen into the sputtering chamber through a first gas injector; and

sputter depositing the titanium layer onto the substrate by applying power to the titanium target and by providing a second gas in the sputtering chamber through a second gas injector, wherein the hydrogen is activated and is in a concentration of at least 0.1 molar percent in the sputtering chamber and whereby the deposited titanium layer has a <0002> ~~<111>~~ crystal orientation; and

sputter depositing an aluminum layer over the titanium layer.

Claim 21: (currently amended) The method of Claim 20 further comprising depositing a titanium nitride layer between ~~overlying~~ the titanium layer and the aluminum layer, whereby the titanium nitride layer has a <111> crystal orientation.

Claim 22: (original) The method of Claim 20 whereby a full width at half maximum of a <111> X-ray diffraction signal of the aluminum layer is less than about 1.5 degrees.

Claim 23: (currently amended) A physical vapor deposition process comprising:

placing a substrate in a physical vapor deposition chamber, said chamber comprising a titanium target;

causing hydrogen to be absorbed into the titanium target;

introducing an inert gas into the chamber; ~~and~~

igniting a physical vapor deposition plasma in the chamber, said physical vapor deposition plasma causing the hydrogen to be released from the titanium target and to attain a concentration of at least 0.1 molar percent in the chamber, causing the hydrogen to be activated, and causing a titanium layer to be deposited onto the substrate

depositing a titanium nitride layer on said titanium layer; and

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depositing an aluminum layer on said titanium nitride layer.

Claim 24: (previously presented) The process of Claim 23 wherein said titanium layer has a <0002> crystal orientation.

Claim 25: (canceled)

Claim 26: (previously presented) The process of Claim 25 wherein said titanium nitride layer has a <111> crystal orientation.

Claim 27: (canceled)

Claim 28: (previously presented) The process of Claim 27 wherein said aluminum layer has a <111> crystal orientation.

Claim 29: (previously presented) The process of Claim 23 wherein said hydrogen is absorbed to a depth of about 50 Å into said titanium target.

Claim 30: (previously presented) The process of Claim 23 wherein, after said hydrogen is released from said target, said hydrogen reacts with a species adsorbed in said substrate.

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